14. The polisher as claimed in claim 11, wherein only one section is illuminated which is a dedicated measurement area.

15. The polisher as claimed in claim 11, wherein more than one section is illuminated.

16. (Amended) A chemical mechanical polisher for planarizing a film on one side of a substrate having two sides comprising at least one light source that transmits light toward the substrate from the side of the substrate with the film to illuminate at least one section on the film and create at least one reflected light signal that is received by at least one means for monitoring thickness change based on the reflected light signal.

17. The polisher as claimed in claim 16 wherein the at least one means for monitoring thickness change based on the reflected light signal comprises a photodetector connected to an interferometer or spectrophotometer.

18. The polisher as claimed in claim 16 wherein each monitored section is minimized in size to remove signal problems.

19. The polisher as claimed in claim 16, wherein only one section is illuminated which is a dedicated measurement area.

REMARKS

Claims 1-10 have been canceled without prejudice so that the remaining claims are directed a chemical mechanical polishing system in which light is transmitted from the side of the substrate with the film.

In the Preliminary Remarks filed with this application, the Applicant had requested that an interference be declared between the present claims and the claims of Lustig '651. After further review, Applicant believes that the present claims 11-19 are patentably distinct from the claims of Lustig '651. For example, the claims of Lustig recite a "window traversing a viewing [illegible] on the underside of the polishing table for measuring

a reflectance," whereas independent claims 11 and 16 lack such limitations. Claims 20-31 have been canceled without prejudice so that claims 11-19 can issue without declaration of an interference.

Claims 11-19 remain patentably distinct from the claims in the parent application (Serial No. 08/401,229), as they do not require interferometric detection.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be examined. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 12/3/02

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Version with markings to show changes made

In the claims:

Claims 1-10 and 20-31 have been cancelled.

Claims 11 and 16 have been amended as follows:

11. (Amended) A chemical mechanical polisher for planarizing a film on one side of a substrate having two sides comprising at least one light source that transmits light [through] toward the substrate from the side of the substrate with the film to illuminate at least one section on the film [creating] and create at least one reflected light signal that is received by at least one device that monitors a dimensional change based on the reflected light signal.

16. (Amended) A chemical mechanical polisher for planarizing a film on one side of a substrate having two sides comprising at least one light source that transmits light [through] toward the substrate from the side of the substrate with the film to illuminate at least one section on the film [creating] and create at least one reflected light signal that is received by at least one means for monitoring thickness change based on the reflected light signal.

Version with markings to show changes made

In the claims:

Claims 59, 62, 68 and 82 have been amended as follows:

59. (Amended) A method for producing a semiconductor device or a patterned layer intermediate, which comprises the steps of:

chemically mechanically polishing at least one layer on one side of the semiconductor device or patterned layer intermediate, wherein the layer is composed of a material selected from the group consisting of an insulating material, a semi-conducting material, a conducting material, and combinations thereof,

illuminating the side of the semiconductor device or patterned layer intermediate not being polished with light of a wavelength between about 1,000 nm and about 11,000 nm during the polishing step so that the light passes through the semiconductor device or the patterned layer intermediate and reaches said at least one layer,

measuring the intensity of the light reflected by said at least one layer,

calculating the thickness of said at least one layer based on the intensity of the reflected light, and

terminating the polishing step when the layer thickness reaches a predetermined value.

62. (Amended) A method for manufacturing a semiconductor device or a patterned intermediate or a silicon-on-insulator wafer from a substrate comprising the steps of

chemically mechanically polishing at least one film on a front side of the substrate, wherein the substrate comprises at least one layer which is composed of a silicon material and wherein said at least one film is composed of a material selected from the group consisting of silicon oxide, silicon nitride, and poly-silicon,

illuminating said at least one film by shining light from a back side of the substrate through the substrate to said at least one film causing light to reflect off of said at least one film,

wherein the illuminating light has at least one wavelength of energy near or below the bandgap energy of the silicon material of the substrate,

analyzing thickness of said at least one film based on interferometry and based on the reflected light, and

stopping polishing when the film thickness reaches a predetermined value.

68. (Amended) A method of removing at least a portion of a layer that is carried on a first side of a substrate, comprising:

applying a material removing substance to an exposed surface of said layer but not to a second side of the substrate opposite said first side, said substance being characterized by modifying electromagnetic radiation incident thereon, whereby material is removed from said layer exposed surface but not from the second side of the substrate,

directing a first beam of electromagnetic radiation against said second side of the substrate to said layer through said substrate, said first beam of electromagnetic radiation including a wavelength band to which each of said substrate and said layer is substantially transparent,

receiving and detecting a second beam of electromagnetic radiation within said wavelength band that is a portion of said first beam that exits the second substrate side after reflection at boundary surfaces of said layer and said substrate, and

concurrently with material being removed from the exposed surface of the layer, monitoring a varying intensity of a component of the detected second beam which results from an interference between portions of the first beam reflected

from said exposed surface and an underlying boundary surface,

[The method of claim 64] wherein said exposed layer surface is irregular with raised and depressed areas thereacross, the material removing substance applied to the exposed layer surface is a slurry of abrasive particles, and material is removed from the layer exposed surface by urging the slurry against the layer exposed surface with a planar surface and providing relative motion between the layer exposed surface and the planar surface.

82. (Amended) A process of removing material carried by a first side of a substrate that is held for processing, comprising the steps of:

placing the first side of the substrate in contact with a material removing substance,

directing through a second side of the substrate and against said material an electromagnetic radiation beam having a wavelength band to which said substrate and said material are substantially transparent, and

detecting a particular characteristic of the state of the material removal process from a component of the radiation beam reflected from said material through said second substrate side, said component having an intensity which varies over time from interference between portions of the radiation beam reflected from different boundary surfaces as said material is being removed,

wherein the material being removed is from a layer of said material that is different from the substrate, and wherein said boundary surfaces include surfaces of said layer,

[The process according to either claim 77 or 81] wherein the placing step includes placing the first side of the substrate in contact with an abrasive medium, and the process further comprises the step of providing relative motion between the first side of the substrate and said abrasive medium.